

**REMARKS**

Reconsideration and allowance are requested in view of the above amendments to the claims and in view of the following information and discussion.

**I. The Rejection Under Section 112**

Under 35 U.S.C. 112, first paragraph, the Examiner has rejected Claims 17-28 as failing to comply with the written description requirement. (Applicant notes that Claims 1-16 are not subject to this rejection.) The Examiner states that Claims 17-28 contain subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time this application was filed, had possession of the claimed invention. This rejection is traversed in view of the following information and discussion.

The Examiner states that, while Claim 17 recites that the coagulant is added after the pH adjustment agent is added, “the specification clearly indicates just the opposite”. The Examiner refers to Figures 1-3 and lines 3-5, page 13 of the specification, as support for that statement. Applicant submits that this support is misplaced.

While Figures 1-3 may show tank K (coagulant) before tank L (pH adjusting material), the present specification is clear that Figures 1-3 represent embodiments of this invention --- refer to page 12, lines 24-25; page 13, line 22; and page 14, line 5. Therefore, contrary to the Examiner’s statement, the specification does not indicate “the opposite” to Claim 17.

Further, the Examiner is referred to line 23, page 8 – line 6, page 9 of this specification as follows:

“In this process, the sequence by which the recycled waste water is treated with a coagulant, non-dissolved air, a flocculating agent and a pH adjusting agent (if used) **is not critical**, if all components used in the process are present in the waste water mixture in the reactor. **A preferred sequence** is to treat the recycled waste water with a coagulant and non-dissolved air, then a pH adjusting material (if used), followed by addition of a flocculating agent to the waste water mixture.”

(Emphasis added.)

Applicant submits that Claims 17-38 comply with Section 112, first paragraph, and requests the removal of this rejection.

## II. The First Rejection Under Section 102

Under 35 U.S.C. 102(b), the Examiner has rejected Claims 1-9 and 11-16 as being anticipated by Ramirez et al. U.S. Patent No. 4,031,006. (Applicant notes that Claims 10 and 17-28 are not subject to this rejection.) This rejection is traversed in view of the above amendments to the claims and in view of the following information and discussion.

The language of 35 U.S.C. 102(b) states that:

A person shall be entitled to a patent unless ---

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of the application for patent in the United States, or....

The interpretation of 102(b) is, without question, that **the denial of a patent requires that the reference teach applicant's invention as defined by the claims**. This requirement is also referred to as "anticipation", and the Courts have provided clear and unambiguous definitions in this area.

In *General Electric Company v. United States*, 572 F.2d 745, 768, 198 U.S.P.Q. 65, 85 (U.S. Court of Claims 1978), a case involving Section 102(e), the Court states:

**To anticipate a claim a prior reference must show each and every element claimed.** Short of this, anticipation does not exist. *In re Royka*, 490 F.2d 981, 984, 180 U.S.P.Q. 580, 583 (cust. & Pat. App. 1974).

(Emphasis added.)

An essential step of the present invention is the use of non-dissolved air; refer to Claim 1 and lines 10-13, page 8 of this specification. **However, the Ramirez patent fails to teach the use of non-dissolved air.**

On page 3-4 of the Office Action, the Examiner states in reference to the Ramirez patent:

“The chemically treated recycle water is then mixed with air in any number of air dispensers (fig. 5-7) or dissolver (fig. 8) at 61 which may or may not involve pumping, the aerated, treated recycle water is then sent to the mixer 12 as described before.”

Clearly, this is not a teaching by the Ramirez patent of the use of non-dissolved air.

Based upon the failure to teach the use of non-dissolved air (an essential step in applicant’s invention), the Ramirez patent is not a proper basis for a rejection of Claims 1-9 and 11-16 under Section 102(b). This rejection should be withdrawn, as all of the limitations of Claims 1-9 and 11-16 are not expressly met by the Ramirez patent.

### **III. The Second Rejection Under Section 102**

Under 35 U.S.C. 102(b), the Examiner has rejected Claims 17-28 as anticipated by the Ramirez patent. (Applicant notes that Claims 1-16 are not subject to this rejection.) This rejection is traversed in view of the amendments to the claims and in view of the following information and discussion.

The standards and requirements for a proper rejection under Section 102(b) are discussed above and will be considered as repeated here.

Claims 17-28, which define an embodiment of this invention, include the use of non-dissolved air as an essential step in this invention. To the contrary, as discussed above, **the Ramirez patent fails to teach the use of non-dissolved air.**

Based upon the failure of the Ramirez patent to teach an essential element of applicant's invention, applicant maintains that this rejection under Section 102(b) should be withdrawn, as all of the limitations of Claims 17-28 are not expressly met by the Ramirez patent.

#### **IV. The First Rejection Under Section 103**

Under Section 103(a), Examiner has rejected Claims 17-28 as obvious over the Ramirez patent. (Applicant notes that Claims 1-16 are not subject to this rejection.) This rejection is traversed in view of the above amendments to the claims and in view of the following information and discussion.

Section 103(a) requires that, if a patent is denied to an applicant, the differences between the subject matter sought to be patented and the prior art must be such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Section 103(a) further provides that patentability shall not be negative by the manner in which the invention was made.

With regard to the requirements for a proper obviousness rejection under Section 103, applicants refer to the following decisions.

The Court of Appeals for the Federal Circuit states as follows in *In re Wright*, 6 U.S.P.Q.2d 1959, 1961 (CAFC 1988):

We repeat the mandate of 35 U.S.C. § 103: it is the invention as a whole that must be considered in obviousness determinations. **The invention as a whole embraces the structure, its properties, and the problem it solves.**

... The determination of whether a novel structure is or is not "obvious" requires cognizance of the properties of that structure and the problem which it solves, viewed in light of the teachings of the prior art.

... (the particular problem facing the inventor **must be considered** in determining obviousness). . . .

... (it is error to focus "solely on the product created, rather than on the obviousness or nonobviousness of its creation"). . . .

(Emphasis added and citations omitted.)

In dealing with the concept of obviousness, the CAFC in the *Wright* case clearly states on pages 1961-2:

Thus the question is whether what the inventor did would have been obvious to one of ordinary skill in the art **attempting to solve the problem upon which the inventor was working.**

The problem solved by the invention is always relevant. The entirety of a claimed invention, including the combination viewed as a whole, the elements thereof, and the properties and purpose of the invention, must be considered.

In either case, the requisite view of the whole invention mandates consideration of not only its structure but also its properties and **the problem solved.**

(Emphasis added and citations omitted.)

Applicant maintains that, without knowledge or recognition of his problem, a patent cannot properly be asserted under the concept of obviousness. There must be at least a suggestion of applicant's problem for one having ordinary skill in this art to use a patent as a basis or starting point toward a solution to such problem.

This theory is not new, as shown by the Court of Customs and Patent Appeals in *In re Shaffer*, 108 U.S.P.Q.326, 329 (CCPA 1956):

In fact, a person having the references before him **who was not cognizant** of appellant's disclosure would not be informed that the problem solved by appellant ever existed. **Therefore, can it be said that these references which never recognized appellant's problem would have suggested its solution.** We think not, and therefore feel that the references were improperly combined since there is no suggestion in either of the references that they can be combined to produce appellant's result.

(Emphasis added.)

In support of their position of nonobviousness, applicants also refer to *In re Hortman*, 121 U.S.P.Q. 218 (CCPA 1959) wherein the Court states on page 219:

For, though the structure may be but a simple expedient when the novel concept is realized, that structure may not be obvious to the skilled worker in the art where the **prior art has failed to suggest the problem or conceive of the idea for its elimination.**

(Emphasis added.)

Contrary to the Examiner's statement on page 4 of the Office Action, the Ramirez patent does not teach every aspect of Claim 17 except for adding the pH agent before the coagulant as recited in step I. The Ramirez fails to teach or suggest the use of non-dissolved air, an essential step of applicant's invention.

While the Ramirez patent does use "a dense supply of bubbles" or "microbubbles", this is not a teaching or suggestion of the use of non-dissolved air. More specifically, the Ramirez patent states:

\* At lines 56-61, column 1:

This invention is an improved method and a means for rapidly forming buoyant agglomerates within a flow of wastewater including a tangential inflow to form an upwardly spiraling vortex column of wastewater in a cylindrical chamber positioned above a dense supply of bubbles.

\* At lines 44-50, column 3:

The bubbles are supplied by the bubble introducing zone below the vortex column rise into the vortex column. Since the bubbles are significantly less dense than either the wastewater or the wastewater impurities, they tend to migrate toward the axis of the vortex column and flow therethrough to assist in the formation of the central core of the vortex column.

\* At lines 65, column 3 – line 60, column 4:

Accordingly, there is a forced segregation of impurities from bubbles as each flows through a large portion of the vortex column. This segregation has decided advantages. First of all, this segregation directs the impurities to the periphery. At the periphery, the impurities can coagulate without significant interference from the bubbles....

Secondly, the segregation provides the advantage that coagulating impurities will traverse an increased path length during which the impurities can be coagulated....

Thirdly, the segregation of bubbles from impurities while they are being coagulated within the vortex column produces a superior venture-type mixing of bubbles and impurities, which occurs along the tangential outflow path....

The desired segregation of the bubbles from the peripheral coagulating impurities flow is further enhanced, as are coagulating conditions in general, when the following optional steps are also taken.

\* At lines 38-53, column 5:

The very fine bubbles needed for this process may be generated electrolytically, through gas dispersion or dissolution, or by a combination of electrolytic generation and gas dispersion or dissolution.... Irrespective of how the bubbles are actually formed, dense clouds of very fine bubbles are introduced into the bubble introducing zone below the vortex column so as to form the dense supply of microbubbles. The bubbles should range in diameter size from about 10 to 500 microns, preferably 20 to 300 microns, and ideally 30 to 150 microns.

These disclosures and teachings from the Ramirez patent fail to suggest the use of non-dissolved air as in the present invention.

Further, the cited Ramirez patent fails to teach or suggest the use of a recycle stream of recycled waste water **from the influent end of the separation unit**. Claims 1 and 17 of this application have been amended to clarify this portion of applicant's invention. Support for this amendment is found on page 15 of the present specification.

The use of recycle water in the Ramirez patent is not restricted to a recycle stream of recycled waste water as in the present invention but, in fact, is only incidental in the Ramirez patent. Reference is made to the following disclosure in the Ramirez patent:

\* At lines 3-16, column 6:

Accordingly, when the particular wastewater being treated by this method requires adjustment of its physical properties, **it is preferred that adjustment not be made to the entire wastewater flow**.

This can be accomplished by adding a supplementary water inflow **directly into the bubble introducing zone**.

This water may be raw or screened wastewater that is tapped from the raw wastewater flow; it may be wastewater that has been clarified by the present process; **or it may be a separate supply of fluid**. Whatever means are utilized, the chemicals to be added, if any, are injected into the supplementary water inflow before it enters the bubble introducing zone and before it is decomposed and/or dispersed or dissolved with gas.

(Emphasis added.)

In view of this failure of the Ramirez patent to teach or suggest (a) the use of non-dissolved air and (b) the use of a recycle stream of recycled waste water from the influent end of the separation unit, applicant contends that the present invention is not obvious from the Ramirez patent. Therefore, this rejection under Section 103(a) should be removed.

## V. The Second Rejection Under Section 103

Under Section 103(a), the Examiner has rejected Claim 10 as being unpatentable over the Ramirez patent as applied to Claim 1 above, and further in view of Dixon et al. U.S. Patent No. 5,308,499. (Applicant notes that Claims 1-9 and 11-28 are not subject to this rejection.) This rejection is traversed in view of the amendments to the claims and in view of the following information and discussion.

The standards and requirements for a proper rejection under Section 103(a) are discussed above and will be considered as repeated here.

The discussion above in regard to the Ramirez patent is applicable to this rejection and, therefore, will be considered as repeated here.

In view of the critical deficiencies of the Ramirez patent under Sections 102(b) and 103(a) as explained above, the invention as defined in Claim 10 is clearly not obvious from the Ramirez patent. Therefore, applicant submits that this portion of the rejection under Section 103(a) is not proper and should be removed.

In regard to this rejection under Section 103(a), applicant submits that the questions to be answered are (1) whether there is a proper basis upon which to combine the Ramirez and Dixon patents in the manner proposed by the Examiner and, if yes, (2) whether the combination renders applicant's invention to be obvious.

On page 5 of the Office Action, the Examiner states:

"To employ such a flocculant in the Ramirez '006 process in which protein containing waste water (meat packing effluent) is purified by flotation would have been obvious to one of ordinary skill in the art."

The Dixon patent is clearly an improvement of the conventional dissolved air flotation (DAF) process. For example, the Dixon patent states:

\* At lines 49-57, column 1:

The techniques of pressure flotation or dissolved air flotation (DAF) is commonly used in water purification. The lack of industrial acceptance of this technique is probably due to economic factors related to the high operating costs of the DAF plants. However, the potential value of DAF for potable water treatment, particularly for raw waters with high algal populations, is now recognized and indications are that it is competitive with conventional sedimentation processes.

\* At lines 13-31, column 2:

We have now found that the combination of a coagulant and a mixture of a cationic polymer or copolymer with an anionic surfactant, a non-ionic surfactant or both can be used to concentrate and separate the organic material present in effluents **using the technique of flotation**. This process is economically viable due to its fast rate of separation and small sludge volume, which reduces the capital, operating and disposal costs.

According to the present invention there is provided an effluent treatment process which comprises the steps of:

- (a) adding a coagulant to the effluent to concentrate the organic material therein;
- (b) treating the thus concentrated organic material with a mixture of a cationic polymer or copolymer in the presence of an anionic surfactant, a nonionic surfactant or both; and

**(c) separating the organic material from the effluent by flotation.**

(Emphasis added.)

\*At lines 26-30, column 3:

The term "flotation" as used herein refers to the techniques in which air is passed through the effluent mixture and air bubbles becomes attached to surfactant-treated, flocculated organic material which then rises to the surface of the effluent water.

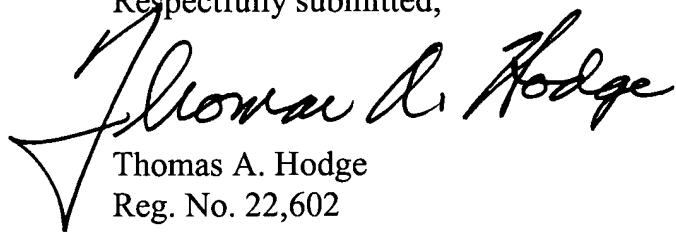
In view of these disclosures and presuming a combination of the Ramirez and Dixon patents, the present invention is not rendered obvious by that combination of patents. The Dixon patent suffers from the same deficiency as the Ramirez patent --- **the failure to teach or suggest the use of non-dissolved air**. Therefore, to add the Dixon patent to the Ramirez patent does not avoid the failure to disclose the use of non-dissolved air as defined and claimed by applicant.

Consequently, applicant requests the removal of this rejection under Section 103(a).

Applicant has made amendments to the claims to more clearly define the present invention. These amendments are properly supported by the present specification.

In view of the above amendments to the claims, information and discussion, applicant maintains that this application is in condition for allowance, which action is requested.

Respectfully submitted,



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